ABSTRACTS OF WATER WORKS LITERATURE

FRANK HANNAN

Key: American Journal of Public Health, 12: 1, 16, January, 1922. The figure 12 refers to the volume, 1 to the number of the issue, and 16 to the page of the Journal.

Water Softening Proposed at Minneapolis. L. I. BIRDSALL. Mun. Cty. Engr., 62: 108–9, 1922. The Mississippi River water varies in total hardness from 220 to 100 parts per million, with an average of 172 p.p.m. of which 162 p.p.m. are alkalinity and 7.1 p.p.m. sulphate. The use of lime is being tried in an experimental plant.—*Langdon Pearse.* (*Courtesy Chem. Abstr.*)

Symposium on the Centralized Softening of a Public Water Supply. Mun. Cty. Engr., 62: 103–8, 1922. Various experts state the feasibility of softening a hard water and urge the economical and aesthetic desirability. Limits of hardness are discussed. The use of lime and soda are generally recommended.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Terre Haute Water Co. Uses Malleable Street Vault Covers to Stand Shocks of Heavy Truck Wheels. D. R. GWINN. Mun. Cty. Engr., 62: 66–8 1922. Ordinary grey iron covers, proven defective under modern truck loads, are replaced by malleable iron covers and frames, with 18-inch diameter opening weighing 215 pounds. These have not broken on account of the higher ultimate tensile strength of the material (45,000 pounds per square inch.).—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Underground vs. Surface Water Supplies with Special Reference to Wauseon, Ohio. W. J. SHERMAN. Mun. Cty. Engr., 62: 63–6, 1922. After serious failure of a well supply in water bearing gravel, a development was made of a surface supply with a drainage area of 4.4 square miles by pumping, with a 60,000,000 gallon earth reservoir. The water is aerated, stored, and filtered. The filter plant has a capacity of 750,000 gallons per 24 hour. Natural gas is used for over half the fuel. *Langdon Pearse.* (*Courtesy Chem. Abst.*)

Cap de la Madeleine Water and Sewer Systems. ROMEO MORRISETTE. Can. Engr., 42: 403–6, 1922. Describes the remodelling of the systems in a town of 6730 people. Detailed costs are given. The cost of laying cast iron pipe was, for 4 inch, $0.103 and, for 6 inch, $0.148 per linear foot. Trenches cost $0.74 per linear foot.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Experience in Centralized Water Softening in McKeesport, Pa., Muskogee, Okla. and Georgetown, Ky. ALEXANDER POTTER. Mun. Cty. Engr., 62:

147–8, 1922. Municipal water softening is entirely practicable. The essentials are complete solution of the chemicals, thorough agitation, and adequate sedimentation.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Discussion of the Centralized Softening of a Public Water Supply. GEORGE A. JOHNSON. Mun. Cty. Engr., 62: 145–7, 1922. Points out feasibility of central softening plants, on lime and soda process or permutation bases, and urges more general use.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Methods and Costs of Building 10 Million Gallon Reinforced Concrete Reservoir for the Indianapolis Water Co. W. C. MABEE. Indiana San. & W. S. Assn. 1922. Mun. Cty. Engr., 62: 141–5, 1922. Structure is designed to store 10 feet 3 inches of water, and to carry an upward pressure of 10 feet of water on the bottom. Groined arch construction (minimum thickness 9 inches) was used for the bottom with a 9 inch flat slab roof, covered with 27 inches of fill. The columns are 24 inches square, 18 feet on centers. The reservoir is 254 feet wide by 542 feet long. The cost was per million gallons water stored, $19,150. Unit costs were excavation $0.56 per cubic yard, concrete $13.05 per cubic yard, placing reinforcing $15 per ton. Wooden forms were used.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Recognition of an Undepreciated Rate Base in some Recent Decisions. W. H BLOOD, JR. Stone & Webster Jour., Dec., 1921. Eng. & Cont. 57: 232 1922. Cites and abstracts a number of cases where an undepreciated base was recognized by the courts in determining rates for utilities.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Engineers Plans for State Boards of Health. Pub. Wks., 52: 237–8, 286–7 341–2, 1922. The practice in various states is described on submission of plans for approval in water or sewage work.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Effect of Gas Plant Wastes on Taste and Odor of Water. C. M. Baker. Proc. Am. Soc.C. E., Dec. 1921, Jan. 1922. Eng. & Cont., 57: 132–3, 1922. Baker describes Milwaukee experience in 1918, where coal tar derivatives were objectionable. Phenol was detected by taste in dilution of 1 to 500,000,000. Closing of a phenol plant temporarily remedied condition. Later tastes were traced to intermittent discharge of gas wastes. By making discharge continuous, conditions were remedied.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Filter Plant Control and Operation. Pub. Wks., 52: 343–5, 1922. Representatives of 46 water purification plants in Ohio give detailed notes on filter plant control and operation, covering collection of samples, standard methods of analysis and operation, including sedimentation, coagulation, filtration and disinfection.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Birmingham's Water Works System. N. M. BERBERICK AND W. A. HARDENBERGH. Pub. Wks., 52: 331–4, 1922. The privately owned system has

grown from 4500 consumers in 1900 to 29,500 in 1921, using nearly 20,000,000 gallons per 24 hours. Water is taken from two sources. A storage dam impounds a reserve supply. The company owns its coal mine. The water is filtered, new equipment being added to old tub filters. 0.2 p.p.m. liq. Cl. are added to filtered water. The average turbidity in 1921 was 300 in the raw water, reduced in receiving basin (125,000,000 gallons capacity) to 75 and in settling basin (30,000,000 gallons capacity) to 25. The filters remove all the bacteria except 5 per cubic centimeter on an average.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Repairing Chicago Water Works Crib. Pub. Wks., 52: 335–6, 1922. The four-mile crib is a steel shell concrete pier 114 feet diameter in water 38 feet deep. The protecting crib was repaired by driving steel sheet piling and filling inside with bags of concrete to seal the cofferdam, then concreting to a height of 9½ feet above water.—*Langdon Pearse.*

Decatur's New Water Works Dam. E. E. PIERSON. Pub. Wks., 52: 336–7, 1922. Describes a $2,000,000 project, including a dam (1100 feet earth, 550 feet concrete spillway), changing bridges and approaches and acquiring the flowage rights, on 4200 acres. A water supply association was formed to acquire the flowage rights, the city paying the interest and sinking fund by an increase in the water rates, and acquiring ownership in 20 years.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

Decreasing Typhoid Mortality. Pub. Wks., 52: 340–1, 1922. U. S. Pub. Health Service figures indicate remarkable reduction in typhoid from 1916 to 1920.—*Langdon Pearse.* (*Courtesy Chem. Abst.*)

How to Determine Need of Water Extensions. GEORGE R. POPP, JR. Fire and Water Eng., 71: 605, April 12, 1922. Investigation of water loss through waste in order to obtain information for the intelligent expansion of distribution systems. Paper read at convention of Indiana San. & Wat. Sup. Assoc. *Geo. C. Bunker.*

Form Temporary Company to Overcome City Debt Limit. PHIL CARLIN. Fire and Water Eng., 71: 608, April 12, 1922. An unusual experiment in water works financing, namely, the formation of a temporary holding company composed of citizens of Sioux City, Ia., in order to overcome the difficulty which confronted the city of extending the water system without the issuance of bonds, which the city was unable to do at the time, owing to statute limitations. As soon as the water works became a self-supporting investment the citizens turned the utility over to the city. The water department now has 10,600 services and is 100 per cent metered. No tax levies for water purposes have been made since 1908. Receipts have grown from $18,370.09 in 1891 to 227,804.63 in 1919.—*Geo. C. Bunker.*

Water Supply of the Delft District. T. G. J. FRANCKEN. Water en Gas, 36–9, Feb. 3, 1922. (cf. Water & Water Eng. London, 24: 149, April 20, 1922.)

Steps were recently taken to improve the supply. A pumping station was installed and a reinforced concrete reservoir constructed with separate annular compartments which favor good circulation and allow cleaning to be carried on without interfering with the supply. Part of the water will be taken from the Rotterdam supply, part from shallow wells in the dunes, and later on the deep water supply will be tapped. Three existing settling basins of 1600 m. total capacity were reconstructed as rough filters in order to enlarge the capacity of the two slow sand filters with a total surface area of 600 m. A cast iron pipe line, 375 mm. diameter, with lead joints was run from Rotterdam. At the final test the line lost 50 liters per hour at pressure of 8 atmospheres.—*Geo. C. Bunker.*

The Provincial Supply of Drinking Water for North Holland. B. F. VAN NIEVELT. Water en Gas, 19–21, Jan. 20, 1922. (cf. Water & Water Eng. London, 24: 149, April 20, 1922.) Discussion of the tariff regulations made uniform throughout the Province. As the undertaking will have in a few years 100,000 consumers, the capital and other charges for meters, if installed generally, would amount to a 40 per cent addition to the price of water, so the tariff was based on the number of rooms or floor space, with meters on industrial services, as being the most economical. Cost of collection of water rates is considerably reduced by payments through the post offices.—*Geo. C. Bunker.*

The Corrosion of Boilers and the Treatment of Boiler Feed Water. A. WINSTANLEY. Water & Water Eng. (London), 24: 47, February 20, 1922. 2400 words. The author is of the opinion that many of the waters now treated by the lime soda process could be more efficiently treated in other ways and barium hydrate is mentioned as a substitute. A low degree of hardness does not always indicate that the water will be good for use in boilers. Two discussions of the above paper are given in the March 20 issue of the same Journal, page 90. R. H. Froude opposes the use of barium hydrate in place of lime and soda, pointing out the many disadvantages of the former as well as its high cost. The latter agrees that a low degree of hardness does not always indicate that the water will be good for boilers; the nature of the salts causing the hardness is the guide.—*Geo. C. Bunker.*

Portable Kit Measures Corrosiveness of Water. Power, 55: 644, April 25, 1922. A description of a simple but accurate method of measuring the amount of dissolved oxygen in a sample of water in connection with the operation of a deaerating apparatus. Written for engineers or operators who have no knowledge of chemistry. Illustrated.—*Geo. C. Bunker.*

What to Know When Selecting Stoker Equipment. J. G. WORKER. Power, 55: 647, April 25, 1922. The combustion characteristics of the principal coals in the U. S. and the types of stokers best suited to burn these coals are listed.—*Geo. C. Bunker.*

The Wheatstone Bridge and How It Operates. C. A. ARMSTRONG. Power 55: 655, April 25, 1922. A simple illustrated explanation is given of the Wheat-

stone bridge and then it is shown how this device is applied to determining the condition of boiler-feed water.—*Geo. C. Bunker.*

Purification of Water with Lime. (Waterreiniging met behulp van kalk). Jan. Smit. Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indie. 1921. Pt. 2. 112–189. Abstract; Sanitation Supplement-Trop. Diseases Bull. (London), 1; 34, March 30, 1922. Houston's method, depending upon a long time contact of the water with a small excess of lime, does not give entirely satisfactory results in the tropics. On adding lime to a turbid river water of Java, so as to give an alkalinity to phenolphthalein equivalent to 2.5 cc. of N/1 acid per liter, and filtering it immediately after through sand, a crystal-clear filtrate containing few bacteria will be obtained. It is claimed that the above alkalinity will kill typhoid and cholera germs and B. coli in a short time. Lime is therefore considered superior to alum as a clarifier.—*Geo. C. Bunker.*

Researches on the Spontaneous Purification of Water Kept in Large Reservoirs in Untempered Sunlight. (Onderzoekingen over de zelfreinigging van in groote reservoirs onder toetreding van het volle zonlicht bewaard water). P. C. Flu. Geneesk. Tijdschr. v. Nederl.-Indie. 61: 3, 294, 1921. Abstract; Sanitation Supplement-Tropical Diseases Bull. (London), 1: 35, March 30, 1922. The author repeated under tropical conditions the experiments of Houston (Thames river water) on the improvement of physical, chemical and bacteriological properties of water from River Tijiliwoeng (Batavia) kept in open basins of 35 liters or a cemented reservoir of 80 cu. m. Cholera, dysentery and typhoid germs disappeared within one week, the first two quicker than the last. In a tropical lowland climate, surface water may be rendered practically harmless by storing it in large open reservoirs for 8 days. Storage may be strongly recommended in cases where the source of a water supply is exposed to gross pollution and a strict bacteriological control of the filtered water is impossible.—*Geo. C. Bunker.*

The Valuation of Waterworks. Water & Water Eng. (London), 24: 117 April 20, 1922. A review of a paper read by George Baxter, of Dundee, at the annual meeting of the Institution of water Engineers on The "Valuation and Rating of Waterworks." Mr. Baxter referred in some detail to the inequalities in the distribution of the burden as between parishes where actual supply takes place and those which merely contain the pipes and reservoirs of the undertaking, but his main purpose was to show that the valuation of waterworks on the revenue principle, which permits of disturbing fluctuations and is dependent solely on the money required annually to meet the capital charges of the undertaking, is inequitable.—*Geo. C. Bunker.*

Prevention of Corrosion of Metals by Water in a Closed System. PERRY WEST. Jour. Ind. & Eng. Chem., 14: 7, July 1922. The theory of corrosion by an aggressive water is described and illustrated by sketches, showing the progressive stages of corrosion and its electrochemical nature involving hydrolysis and ionization. At 180° F. corrosion is about ten times as rapid as at 50° and at 210° it is again about ten times rapid as at 180°. Annual loss in do-

mestic hot water service due to corrosion is estimated at $50,000,000. Evidence proves the rate of corrosion to be directly proportional to the concentration of dissolved oxygen in various waters. Curves are presented showing the solubility of oxygen in water at varying temperatures and under different pressures. The high limit of dissolved oxygen for certain cases is 0.75 cc. per liter, but to prevent serious corrosion in the modern high-pressure steam plant, such must be maintained at 0.2 cc. or less. Two types of commercial deactivators designed for hot water systems in apartment houses, large building and boiler-plants are described and illustrated. It is claimed that they remove practically all dissolved gases, including oxygen, by an initial physical process followed by a chemical finishing process. The equipment is claimed to have proven an economic success.—*L. H. Enslow.*

Sewage, Applicability of the Process of Purification of, by Activated Sludge to the Separative System. L. CAVEL. Comptes rend., 174: 578–580, 1922. J. Soc. Chem. Ind., 41: 229a, 1922. Laboratory experiments conducted on a strong sewage, obtained from a town where the separative system is adopted and thus the sewage is not diluted by rain water, show that the activated sludge process may quite well be applied to such material. In the laboratory trials the alkalinity, the ammonia, and the sulphides disappeared completely, the oxidisability was lowered by 72.8 per cent, the number of bacteria by 92.4 per cent, and the organic nitrogen by 76 per cent.—*W. G.* (*Courtesy A. M. Buswell*)

Bacillus coli, Biology of. Endo's reaction. O. FERNANDEZ AND T. GARMENDIA. Anal. Fis. Quim., 19: 313–319, 1922. J. Soc. Chem. Ind. 41: 229a, 1922. The red color produced by B. coli in Endo's medium (bouillon, with agar containing lactose, fuchsin, and sodium sulphite) is probably produced not by acetaldehyde but by lower acids of the fatty series. The production of acetaldehyde by the agency of B. coli was studied using different modifications of Endo's medium. (Cf. J. C. S. April.).—*G. W. R.* (*Courtesy A. M. Buswell*)

The Treatment of Swimming Pool Water with Ultraviolet Rays. W. F. WALKER. Amer. Jour. Pub. Health, 12: 320, 1921. Illustrations show desirable features in swimming pool design. Relative rate of purification for eight and twenty four hour operating day periods are shown by charts. The author concludes that the high turn-over rate and uniform distribution are essential, that bacteriological standards should be used, that a high flow of fresh water gives satisfactory results but is expensive, that re-circulation with filtration and sterilization by ultraviolet rays gives satisfactory counts in the pool.—*A. M. Buswell.*

Industrial Wastes in Relation to Water Supplies. Wellington Donaldson. Amer. Jour. Pub. Health, 12: 420–2, May, 1922. A continuation of the discussion of the subject as set forth in a previous article (this journal, 11, 193) In this paper the author calls attention especially to petroleum wastes, wastes from oil well operation and various other industries. He calls especial atten-

tion to the importance of the mineral analysis in detecting pollution from certain manufacturies such as zinc smelters, etc.—*A. M. Buswell*

Lead, Determination of Minute Amounts of, in Water, with Notes on Certain Causes of Error. D. AVERY, A. J. HEMINGWAY, V. G. ANDERSON, AND T. A. READ, Proc. Austral. Inst. Min. Met., 173–199, 1921. Jour. Soc. Chem. Industry, **41**: 154 a., Feb. 28, 1922. The sample is filtered and the lead determined in the sediment and clear liquid separately. 2.5 to 5 l. of the latter is evaporated to 250 cc., neutralised, and treated with an excess of 2 cc. of hydrochloric acid; the solution is again filtered and the filtrate saturated cold with hydrogen sulphide. After standing overnight, the solution is filtered, the precipitate washed with hydrogen sulphide water, and dissolved in nitric acid. The solution is evaporated with 1 cc. of sulphuric acid until it fumes, 20 cc. of water and 10 cc. of absolute alcohol are added, and the lead sulphate filtered off next day. It is dissolved in ammonium acetate and the solution, in a Nessler tube, treated with 1 cc. of 10 per cent potassium cyanide solution, 1 cc. of ammonia, and six drops of freshly prepared ammonium sulphide solution. The color is compared with that obtained by adding the same amounts of reagents to a standard lead solution (1 cc. 0.00001 g.Pb). The sediment is evaporated to dryness with hydrochloric acid, the residue treated with 2 cc. of the same acid and 250 cc. of water and the filtered liquid treated as described above. Waters containing organic matter, e.g. urine, are evaporated with nitric acid to dryness, the residue is heated to 450°–500°C., for 20 minutes, and the cold mass extracted with hydrochloric acid. The filtered solution is then treated as described above. All the reagents used must be redistilled from glass apparatus free from lead, the filter papers must be washed free of lead with hot hydrochloric acid hot ammonium acetate and hot water successively, and a volume of distilled water equal to that of the sample must be put through the whole process as a blank. (Cf. J. C. S. Mar.)—*A. R. P.* (*Courtesy A. M. Buswell*).

How Maps Speed Up Valve Closing. WM. W. BRUSH. Fire and Water Eng., **71**: 19, 779, May 10, 1922. To facilitate the location and closing of valves in a waterworks distribution system, a system of maps showing mains, valves, sizes and number of turns is described.—*A. W. Blohm.*

What Do You Know About Water Works Finance? WILLIAM H. LAWRENCE. Fire and Water Eng., **71**: 19, 781, May 10, 1922. Water rates depend on the financial management of a water works. A method of financing is explained, which includes a sinking fund for liquidating the bonded debt and a depreciation fund to provide for renewals.—*A. W. Blohm.*

Some Practical Experiences with Meters. J. W. HOCKADAY. Fire and Water Eng., **71**: 19, 785, May 10, 1922. Experiences of the Water Department of Cleburne, (Texas), in the placing and inspection of water meters.—*A. W. Blohm.*

Efficient System for Filing Water Service Records. DOW R. GWINN. Fire and Water Eng., **71**: 19, 787, May 10, 1922. Water Works Company of Terre

Haute (Ind.), uses envelopes of heavy Manila, for filing purposes. An envelope is kept for each service, in which all necessary data are filed. A card index is also used so that all of the information is instantly available.—*A. W. Blohm.*

Good Publicity Will Keep Consumer Happy. FRED SHEPPERD. Fire and Water Eng., **71**: 19, 789, May 10, 1922. Value of private plants keeping in touch with patrons, by means of advertising, is brought out.—*A. W. Blohm.*

Keeping Tab On What You Have Underground. ROBERT F. JOHNSON. Fire and Water Eng., **71**: 19, 790, May 10, 1922. Saginaw, (Mich.) keeps records of watermains, service connections, fire hydrants, etc. The payment of water for public use, and the collecting of water bills is discussed.—*A. W. Blohm.*

Find Out Where All Your Water Goes. A. S. HOLWAY, Fire and Water Eng., **71**: 19, 791, May 10, 1922. Oklahoma City (Okla.), by a careful water waste survey, located and repaired leaks in mains and fire hydrants, and replaced old or dead meters. This survey with careful inspection is saving daily 2,800,000 gallons of water, or 41 per cent of the present total pumpage.—*A. W. Blohm.*

A Filtration System With Unique Features. GEORGE A. JOHNSON. Fire and water Eng., **71**: 19, 793, May 10, 1922. Article describes in detail watershed conditions, and design of the water filtration plant, under construction, at Cambridge, Mass.—*A. W. Blohm.*

What A Water Works Man Has To Contend With. FRED SHEPPERD. Fire and Water Eng., **71**: 19, 795, May 10, 1922. Several incidents are cited of various means employed by the water thief, to escape payment for water used.—*A. W. Blohm.*

Efficiency Test of Water Works Pumping Machinery. L. M. GAZIN. Fire and Water Eng., **71**: 19, 799, May 10, 1922. Details of tests, for speed and capacity, of two pumping units and turbines at Fort Smith, Ark.—*A. W. Blohm.*

Clarksburg, W. Va., Water Supply. Scotland G. Highland. A neat booklet with nine good illustrations of the 9 m.g.d. plant. Leaky fixtures and the remedy are well and practically treated. Interesting extraneous matter included.—*Frank Hannan.*

Water Meters and Water Loss in Indiana. Anon. Eng. News-Rec., **88**: 612, 1922. At East Chicago, Ind., meters reduced the consumption from 200 gallons per capita in 1920 to 70 gallons in December, 1921 when only 12 per cent was unaccounted for. At Gary 83 per cent of the water pumped to their 50 per cent metered system was accounted for. Losses at North Manchester were only 6.77 per cent and at Lexington, Ky., 16.5 per cent. Of the $50,000

being spent by the Frankfort Water Company on new work, $33,000 was for meters.—*Frank Bachmann.* (*Courtesy Chem. Abst.*)

Operating Data for Three Filters Using Lake Michigan Water. S. A. GREELEY AND H. E. JORDAN. Eng. News-Rec., **88**: 578–9, 1922. Data compiled for filter plants at East Chicago, Whiting, and Evanston. The plants have a rated capacity of 8, 4, and 12 m.g.d. respectively. Comparative data indicated that the cost of coagulants in the East Chicago and Whiting plants was more than double that at Evanston. This difference is no doubt due to the character of the raw water.—*Frank Bachman.* (*Courtesy Chem. Abst.*)

Typhoid Fever From Water Held Compensable. Anon. Eng. News-Rec., **88**: 617, 1922. Under the Workmen's Compensation Act of Indiana according to a decision of the Appellate Court, typhoid fever contracted from impure water is held to be an "injury" by accident arising out of and in the course of the employment.—*Frank Bachmann.* (*Courtesy Chem. Abst.*)

Estimated and Average Daily Water Consumption in St. Louis. EDWARD E. WALL. Eng. News-Rec., **88**: 619, 1922. The figures show that the annual daily average will be exceeded by 125 per cent for the maximum month in any year; by 135 per cent for the maximum week; and by 150 per cent on the maximum day.—*Frank Bachmann.* (*Courtesy Chem. Abst.*)

Waterproofing a Leaky Reservoir at Nashville, Tenn. J. N. CHESTER. Eng. News-Rec., **88**: 310–2, 1922. The leakage was remedied by a lining composed of 2 layers of gunite with an asphaltic burlap membrane between them.—*Frank Bachmann.*

Importance of Railway Water Supply. Committee Report. Amer. Railway Eng. Assn., 1922. Eng. News-Rec., **88**: 640, 1922. Railroad water consumption aggregates 900 billion gallons at 14,000 stations involving $100,000,000 for operation and maintenance per year. This expense is considered small as compared to operation and repair of locomotives due to poor water supplies.—*Frank Bachmann.* (*Courtesy Chem. Abst.*)

Legislation and Procedure for Enforcing Correction of Stream Pollution and Improvement of Water Supplies. Administrative Bulletin No. 133, Ohio State Department of Health, 1921. A compilation of the laws providing for correction of pollution of streams by sewage and other wastes from municipalities, institutions, industrial establishments and other sources, and for the improvement of impure and unsafe public water supplies of municipalities and public institutions.—*E. S. Chase.*

Report of the Department of Food, Drugs, Water and Sewage, Monthly Bulletin, Indiana State Board of Health, 24: 12, 136, December, 1921. Two examples of sanitary hazards to water supply are given. At one filter plant the single low service pump to the filters was broken and raw water was pumped directly to the town. At another water works the supply of chlorine for sterilization

had become exhausted and unsterilized water had been delivered to the city resulting in an outbreak of intestinal trouble.—*E. S. Chase.*

The Romance of Water Storage. GEORGE A. JOHNSON. North Carolina State Board of Health. 36: 12. A paper setting forth in a popular way Johnson's well-known views on storage as an inadequate method for protecting the sanitary quality of public water supplies.—*E. S. Chase.*

Development of Water Supply in the Metropolitan District. MORRIS R. SHEPPERD. Public Health News, N. J. State Department of Health; 7:4–5, 83, March–April, 1922. Points out the need of planning for the future water supply needs of the New York Metropolitan area, and particularly that part located in northern New Jersey. The population of the N. J. territory is increasing at approximately 4 per cent per year and water consumption somewhat faster. It may be estimated that in the next 25 years a supply of 500,000,000 gallons daily will be required and in 50 years, 1,000,000,000 gallons for the New Jersey territory alone. He concludes that inasmuch as there will exist the need of reciprocity between neighboring states in water supply matters, a commission be established representing the States of Pennsylvania, New Jersey, New York and Connecticut.—*E. S. Chase.*

1921 Vital Statistics Review for New York State. Monthly Bull. N. Y. State Dept. Health. 2: 12, Feb. 1922. Of interest to the water works engineer is the marked decline in typhoid fever shown by a diagram in this bulletin. In N. Y. the typhoid fever death rate, which was approximately 32 per 100,000 has declined to 3.6 in 1921.—*E. S. Chase.*

Semi-annual Report Div. Eng. and Sanit., July–December, 1921. H. F. FERGUSON. Illinois Health News, 8: 3, 64, March 1922. A review of the activities of this division which include consideration of proposed water supply projects, examination of existing supply, and inspection of purification plants and co-operation with U. S. P. H. S. in supervision of water supply for common carriers. The review tabulates the investigations made regarding water supplies between July 1, 1918 and June 30, 1920. A program for further work of the division is also outlined.—*E. S. Chase.*

Water Treatment from an Investment Standpoint. L. F. WILSON. Railway Review, 69: 602–19, 1921. Consideration is given to the varying quality of railroad water supply and attention is called to the economy of internal treatment where expense of treating plant installation is not warranted.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

The Interior Treatment of Boiler Waters. C. R. Knowles. Railway Age, 71: 935–20, 1921. It is estimated that 50 per cent of the boiler water used on Amer. railroads is of such quality that treatment would show economy in locomotive operation and of this amount only 6 per cent is being treated by exterior method. Construction of treating plants for the remaining 94 per cent will take years, and interior treatment is recommended in the meantime. *R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Use of Boiler Compounds. L. F. WILSON. Railway Age, 71: 1077–23, 1921. Comments on Knowles Article. Interior treatment is recommended.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Interior Boiler Treatment as an Alternative. R. C. BARDWELL. Railway Age, 71: 1184–25, 1921. Comments on Knowles article. Careful check of water quality is recommended.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Boiler Compound and Anti-Foaming Compounds. W. H. Hobbs. Railway Age, 71: 1132–24, 1921. Comment on Knowles article. Difference between anti-scale and anti-foam compounds is emphasized.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

A Difference of Opinion on Water Treatment. W. H. GREEN. Railway Age, 72: 313–5, 1922. Comments on Knowles articles. Excessive agitation is harmful. Filtration is beneficial to remove the foaming tendencies caused by suspended matter.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Improvement and Control of Boiler Waters. W. M. BARR. Railway Age, 72: 364–6, 1922. Comments on Knowles Article. U. P. R. R. uses 75 per cent of all anti-foaming compound on district which has no softening plants. Careful check of water quality is recommended.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

An Advocate of Soda Ash. R. W. CHORLEY. Railway Age, 72: 412–7, 1922. Comments on Knowles article. Where incrusting solids are not high, treatment of water in wayside tanks is recommended.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

The Boiler Compound. D. K. FRENCH. Railway Age, 72: 907–15, 1922. Comments on Knowles article. Quotations from several articles are given favoring use of boiler compounds.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Treated Water Improves Locomotive Performance. W. A. POWNALL. Railway Age, 72: 794–12, 1922. Comments on Knowles article and gives full review of soda ash treatment on Wabash Ry. Tests show that with excess soda ash treatment and proper blowing off results will, (1) Keep heating surfaces comparatively free from scale, (2) Cause the scale forming solids to be deposited as soft sludge, (3) Practically eliminate engine failures due to leaky flues, fireboxes, etc. (4) Reduce staybolt breakage and fire box renewals. (5) Decrease cost of boiler repairs (6) Increase mileage between washouts.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

The Interior Treatment of Boiler Waters—A Criticism. C. H. KOYL. Ry. Age, 71: 1241–26, 1921. Comment on article by Knowles. Foaming is caused by sludge and suspended matter. Instance is cited where a water containing 1000 gr. per gal. initial Na salt conc. is used successfully. External treatment is advocated where water contains over 12 gr. per gal. incrustants.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Study of Progress of Regulations of Federal or State Health Authorities Pertaining to Drinking Water Supplies. Comm. Report Amer. Ry. Eng. Assoc. Bul., **242**: 487, 1921. Ry. Age, **72**: 689–10, 1922. Review of recent regulations by Public Health Dept. relative to railway drinking water supplies.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Effect of Local Deposits on Pollution of Surface and Shallow Well Water Supplies. Com. Report. Amer. Ry. Eng. Assoc. Bul.. **243**: 690 1921. Ry. Age, **72**: 689–10c, 1922. Typical instances of pollution are given.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Study and Report on Pitting and Corrosion of Boiler Tubes and Sheets, Character of Metal, Methods of Manufactures, Construction of Boilers, and Quality of Water Considered. Com. Report. Amer. Ry. Eng. Assoc. Bul., 243: 493, 1921. Ry. Age, **72**: 689–10c, 1922. A preliminary report. Survey of field indicates electrolytic actions as chief cause and investigation will be made further with this in view. Results of questionaire and photos showing typical conditions are given.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Study and Report on Specifications for Various Chemicals Used in Water Treatment. Com. Report. Amer. Ry. Eng. Bul., **243**: 498, 1921. Ry. Age, **72**: 689–10c, 1922. Specifications for soda ash, hydrated lime, quicklime, sulphate of alumina, and sulphate of iron were adopted.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Report on Centrifugal Pumps for Railway Water Service. Com. Report. Amer. Ry. Eng. Assoc. Bul. **243**: 508, 1921. Ry. Age, **72**: 689–10c, 1922. A full discussion of centrifugal pumps adaptable to railway service is given.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Standards. Com. Report. Amer. Ry. Eng. Assoc. Bul., **243**: 514, 1921. Ry. Age, **72**: 689–10c, 1922. Amer. Wat. Wks. Assoc. Spec. for C. I. pipe, and hydrants and valves were adopted as standard for railway service.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

University Work of Interest to Railway Water Supply. Com. Report Amer. Ry. Eng. Assoc. Bul., **243**: 527, 1921. Ry. Age, **72**: 689–10c, 1922. Investigations recently completed or underway at Purdue U., U. of Iowa, U. of Montana, U. of Manitoba, and Sheffield Scient. School were mentioned.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Water Analysis for the Non-Technical Man. Cass Kennicott. Railway Age, **72**: 1168–20, 1922. Recommendation is made for reporting results in lbs. per 1000 gal. which can be visualized by average operating official.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Missouri Pacific Continues to Show Large Savings from Water Treatment. Anon. Railway Age. 72. 1188–20, 1922. Mo. Pac. R.R. treated

1,781,560,000 gal. in 1921 removing 4,916,247 lbs. scaling solids at a total expense of $170,575. They had 77 treating plants which cost $309,611 and 34.6 per cent of water used was softened. Coal saved was 62,000 tons.—*R. C. Bardwell.* (*Courtesy Chem. Abst.*)

Indianapolis' Ten Million-Gallon Covered Reservoir. W. C. MABEE. Eng. News-Record, 88: 739–40, 1922. This reservoir was built in 120 days and cost $223,500. High ground water limited the depth. It is 254 by 542 feet in plan and 10 feet 8½ inches deep. Method of construction and equipment used are detailed.—*Frank Bachmann* (*Courtesy Chem. Abst.*)

New Jersey Tax Finances State Board. ANON. Eng. News-Record, 88: 702, 1922. The Department of Conservation and Development levied $23,262 against 27 water-supply systems for excess diversion of water during 1921. The 27 systems supply 1,801,500 people and the charge amounts to 1.3 cents per capita.—*Frank Bachmann* (*Courtesy Chem. Abst.*)

Operation and Tuning up of the Cleveland Filters. J. W. ELLMS. Eng. News-Record, 88: 776-9, 1922. Major changes consisted in reducing the number of baffles in the mixers, discarding certain of the lime-handling machinery, installing a dust filter for reducing the lime dust nuisance when unloading cars and substituting water ejectors for motor-driven pumps for feeding the various chemical solutions. The normal capacity of the plant is 150 m.g.d. but its actual capacity is 130 m.g.d. because it is impossible to operate the entire plant. Operating and analytical data are given.—*Frank Bachmann* (*Courtesy Chem. Abst.*).

CO_2, Odor and Iron at Virginia Beach, Va. RICHARD MESSER, A. WAGNER, & LINN H. ENSLOW. Eng. News-Record, 88: 774–5, 1922. Raw water is taken from 31 driven wells in an old marsh area. The wells are 2 inches diameter and 20 feet deep. The water is highly colored and has a noticeable odor. Treatment consists of: aeration through nozzles; lime and chloride of lime treatment followed by sedimentation; filtration through sand; and storage in covered reservoir. The Cl aids in removal of color and odor. Main object of lime is complete removal of CO_2 and formation of "blanket" on filter. Installation has replaced cisterns as laundry supplies and bottle water for table use.—*Frank Bachmann* (*Courtesy Chem. Abst.*)

Mechanical Equipment for Detroit Water Main Extension. ANON. Eng. News-Record, 88: 776–9, 1922. Approximately 100 miles of water mains ranging in size from 4 inches to 4 feet but mainly 6 to 8 inches, are laid per year. and because of this the city has organized a well equipped force. Machines are provided for trenching, handling pipe and back-filling and many special shop and field operations.—*Frank Bachmann.*

Central Repair Shop for Philadelphia Water-Works. JOHN M. BROGGINI. Eng. News-Record, 88: 772–3, 1922. Units heretofore scattered over the city have been brought together in a central shop.—*Frank Bachmann.*

Operation Control Panels for the Sacramento Filters. ANON. Eng. News-Record, **88**: 782–4, 1922. Unique features of control are: upright panels; valve-opening indicators of colored liquids in glass tubes; loss of head gages; rate of filtration. gages are air gages; and the wash-water rate is indicated directly from a Pitot tube in the wash line.—*Frank Bachmann* (*Courtesy Chem. Abst.*).

Largest Storage Reservoirs in the United States in Use in 1920. ALLEN HAZEN. Eng. News-Record, **88**: 799, 1922. A list of reservoirs with capacities compiled for the Committee on Water Supply of England Council.—*Frank Bachmann* (*Courtesy Chem. Abst.*).

Chester (England) Water Works: Past and Present. FREDERICK STORR AND C. WILFRED BENNETT. Water and Water Eng., **24**: 193, 1922. An historical account tracing the development from Roman times to date. Plant depends upon slow sand filters, but pressure filters of the Paterson type were contracted for in 1921.—*Jack J. Hinman, Jr.* (*Courtesy Chem. Abst.*).

Central Water Supplies for Settlements. Neuber. Zentralblatt der Bauverwaltung, 213, April 29, 1922. Water and Water Eng., **24**: 186, 1922. Compares costs of various plans for towns of less than 10,000 and finds that separate water works will in many cases be cheaper than individual wells and that cost of connecting to system of neighboring town may be no more economical on account of raising to high levels in the town.—*Jack J. Hinman, Jr.* (*Courtesy Chem. Abst.*).

Protection of Iron Against Rust. J. A. HEYMANN, Water en Gas, Mar. 31, 1922. Water and Water Eng., **24**: 227, 1922. Iron in contact with water gives off ferrous ions; if air be present, these change to ferric and $Fe(OH)_3$ is precipitated. Iron would not rust in moist air were temperature and pressure constant, otherwise moist air has same effect as water. Lengths of iron pipe were sand blasted and then painted with protective compositions. Then placed in glass cylinders containing gelatine 14 per cent potassium ferrocyanide 0.1 per cent, and 0.01 per cent phenol, in water, phenol for preventing bacterial growth. Appearance of iron demonstrated by blue color in the jelly. Sideros-then, bitumeni, and bitumen enamel were tested. Best protection by one coat and immediate immersion. No composition gave absolute protection. Action started in patches but went on over the entire surface.—*Jack J. Hinman, Jr.* (*Courtesy Chem Abst.*).

The Lozoya Water and Typhoid Fever. IOSE NICOLAU. Riv. de Obras Publicas, 2373; 2–9, 1922. Water and Water Eng., **24**: 186, 1922. Typhoid mortality in Madrid averages one-fifth of total. Has been attributed to Lozoya river water, from Isabella II canal. There are reasons to think protection of this source ample. Part of supply comes from the river Manzanares, but no reason to think differently collected than the Lozoya water. Discusses bacterial origin of paratyphoid and typhoid fevers.—*Jack J. Hinman, Jr.* (*Courtesy Chem. Abst.*).

The Purification of Swimming Pools by Means of Chlorine. Bulletin d'Hygiene balnéaire et de Propreté, 9: 18, 1921. Bulletin Internat. Office d'Hygiene Publique, 14: 5, 582, May 1922. Review s the regulations of the State Boards of Health of California and Florida, and discusses the use of Wallace and Tiernan chlorinators in treating the water.—*Jack J. Hinman, Jr.*

Experiments on the Vitality of Cholera Vibrios and Typhoid Bacilli in Sea Water. P. C. FLU. Mededeelingen den Burgerlijken Geneeskundigen Dienst in Nederlandsch-Indië, 3: 317, 1921. Bulletin Internat. Office d'Hygiene Publique, 14: 5, 563, May, 1922. Experiments with sea water artificially contaminated. The cholera vibrios survived 4 or 5 days, as did the typhoid bacilli in one experiment. Similar results were obtained with the cholera vibrios and river water.—*Jack J. Hinman, Jr.*

Experiments on the Longevity of the V. Cholerae and B. Typhosus in Septic Tanks at Batavia. P. C. FLU. Mededeelingen Burgerlijken Geneeskundigen Dienst in Nederlandsch-Indië, 3: 289, 1922. Bulletin Internat. Office d'Hygiene Publique, 14: 5, 564, May, 1921. F. tried to recover the B. typhosus from the effluents of septic tanks using the method of precipitation by ferrous sulphate and sodium carbonate. No positive results were obtained except in the case of artificially seeded tanks. The survival of the organisms did not exceed 24 hours for v. Cholerae nor 2 to 3 days for B. typhosus.—*Jack J. Hinman, Jr.*

The General Construction of Colloids. WO. PAULI. Kolloid-Z, 28: 49–51, 1921. From Chem. Abst., 16: 182, January 20, 1922. Formulas are given for some colloidal hydrosols, including $Al(OH)_3 \cdot Al(OH)_2 \cdot Cl$, in which the colloidal ion may be either positive or negative.—*R. E. Thompson.*

The Effect of Freezing on Colloidal Selenium. A. GUTBIER AND F. FLURY. Tech. Hochschule Stuttgart. Kolloid-Z., 29: 161-72, 1921. From Chem. Absts. 16: 182, January 20, 1922. The coagulation of colloids by freezing was studied, selenium hydrosols being used in the experiments. Secondary sols, less stable than the original preparation, are obtained on freezing and remelting. If the primary sol is dialyzed the stability of the secondary sols obtained varies inversely with the length of time dialysis, until finally complete coagulation results on freezing. The sols are more sensitive to freezing the greater the concentration of the colloid.—*R. E. Thompson.*

Thickness of Stratified Films. P. V. WELLS. Ann. Phys., 16: 69–110, 1921. From Chem. Abst., 16: 185, January 20, 1922. The author, in studying the thickness of soap bubble films, confirmed Perrin's statement that "The (colored) regions of the films are formed by the superposition of a number of identical elementary leaflets." The thickness of the elementary leaflet is the same as the thickness of the black spot and is considered to be about 4.4 millimicrons. Both the spot and the leaflet are considered to be bimolecular layers of oleic acid.—*R. E. Thompson.*

American Research Chemicals. C. J. WEST. National Research Council, Reprint and Circ. Series 23, 28 pp., 1921. From Chem. Abst., **16**: 195–6, January 20, 1922. Lists are given of the manufacturers of research chemicals, biological stains and indicators, and H-ion indicators.—*R. E. Thompson.*

Chlorination and the Formation of Chloramines by Means of Nitrogen Trichloride. G. H. COLEMAN WITH W. A. NOYES. J. Amer. Chem. Soc., **43**: 2211–7, 1921. From Chem. Abst., **16**: 244, January 20, 1922. The chlorination of benzene, toluene, benzyl chloride and ethyl chloride by means of nitrogen trichloride was investigated. Equations are given explaining the results obtained.—*R. E. Thompson.*

Automatic Recording and Analytical Apparatus. L. LEVY. Chem. Age (London) **5**: 652–5. 1921. From Chem. Abst., **16**: 513, February 20, 1922. A brief description of recording thermometers and pressure gages, total quantity meters, carbon dioxide recorders, etc., is given.—*R. E. Thompson.*

Boiler Water Treatment Plant. R. JUNE. Blast Furnace and Steel Plant. **9**: 670–2, 1921. From Chem. Abst., **16**: 454, February 10, 1922. The relative advantages of zeolitic water softeners are discussed. Permutite is classed as a slow-acting and Borromite as a rapid-rate softener, both systems furnishing water of zero hardness. Distilling plants and evaporators, both "single" and "multiple" effects, are sucessfully used in many power plants. The operating results of a Griscom Russell installation are given.—*R. E. Thompson.*

Procter-Wilson Theory as a Working Tool. Its Application to Sewage Disposal. J. A. WILSON. J. Soc. Leather Trades Chem., **5**: 268–73, 1921. From Chem. Abst., **16**: 454, February 10, 1922. The Procter-Wilson theory of the swelling of protein jellies has been applied to the filtration of Milwaukee sludge. The rate of filtration was shown to be a function of the pH value, and was increased 300 per cent at the optimum value of 3.2. By adding aluminium sulphate and adjusting the pH to 4.3 an increase of 700 per cent was obtained. A complete bibliography is given.—*R. E. Thompson.*

Progress in Cement Making. L. MALPHETTES. Rev. mat. Constr. trav. pub. No. 140, 81–4, 1921. From Chem. Abst., **16**: 623, February 20, 1922. An outline is given of the manufacture of three new types of cement, namely: (1) fused cement, (2) hydraulic lime converted to clinkers by heating in a rotary kiln, and (3) schist cements. Le Chatelier's formula for the formation of $SiO_2 \cdot 3\,CaO$ in artificial cements does not apply to fused cement. Bied states that the latter contains $SiO_2 \cdot 2CaO$ and $Al_2O_3 \cdot CaO$.—*R. E. Thompson.*

The Action of Sodium Carbonate on Chrome Alum Solutions Aged at Constant Temperature. L. MEUNIER AND P. CASTE. Le Cuir, 10, 290–2, 1921. From Chem. Abst., **16**: 357, January 20, 1922. The amount of sodium carbonate required to start precipitation in chrome alum solutions allowed to stand at constant temperature in diffused light was found to increase to a maximum in

a period of a few hours to days, then slowly decrease to a minimum in a period of weeks or months. It is concluded that chromium sulphate hydrolyses, the chromium hydroxide being first peptized by the normal sulphate with which it slowly forms a less ionized complex. Hydrolysis proceeds further, increasing the ionization and conductivity, and lessening the peptization of the chromium hydroxide. The former reaction predominates first, causing the amount of sodium carbonate required to increase, until the increasing effect of the secon reaction causes it to reach a maximum and subsequently decrease.—*R. E. Thompson.*

Quick Hardening Cement Developed by the French. E. C. ECKEL. Eng. News-Record, 87: 566–7. 1921. From Chem. Abst., 16: 325, January 20, 1922. A quick hardening, fused cement, consisting of lime 50 per cent alumina 40 per cent and silica etc., 10 per cent is discussed by the author. Test specimens 24 hours old show strengths comparable with 28-day portland cement specimens. In laboratory experiments cubes of this cement have been exposed to (1) sea water (2) saturated calcium sulphate solution and (3) 1.2 per cent magnesium sulphate solution, for nine years and are still intact. This is a remarkable feature as, until the introduction of fused cement, it was generally considered that the disintegration of portland cement in sea water was due to to its alumina content.—*R. E. Thompson.*

Waterproofing Concrete. J. H. BURGESS. Commonwealth Eng. (Melbourne) 8, 248–50, 278–82, 306–7, 1921. From Chem. Abst., 16: 325–6, January 20, 1922. Conclusions are given based on the results of tests made for the permeability of concrete; the pore-filler used being a fine blue metal dust, which acts as puzzolana and fixes the lime. Low permeability and increased strength are obtained by use of fine cement, owing to its greater covering capacity and also to a larger percentage being chemically acted on by the water. Surface area of the particles in all concretes is very important especially in lean mixtures. Blue metal dust increased the impermeability and the strength of mortars of all ages and of concrete at ages of 6 to 12 months. The amount used should be in the proportion of 1 part of blue metal dust to 2 parts of cement.—*R. E. Thompson.*

Progress in Investigation of Alkali Action on Concrete. E. C. BEBB. Eng. World, 18: 391–4, 1921. From Chem. Abst., 16: 326, January 20, 1922. The conclusions drawn from field tests conducted by a committee consisting of representatives of the United States government Bureaus and of the Portland Cement Association: (1) Hand-made tile of quaking or mushy consistency, and tile made on a tamping machine, give the best results. (2) The action of alkali sulphates is more severe than that of chlorides or carbonates (3) Lean mixtures are more seriously and rapidly affected than rich mixtures. (4) On the basis of the percentage of total solids in waters containing sulphates, disintegration of the poorer grades of concrete begins at 0.2 per cent and increases with the concentration up to 2 to 3 per cent, at which concentration even the best concretes disintegrate rapidly. (5) Durability appears to be dependent upon impermeability, which is determined by the richness of the mixture and gradation of aggregates.—*R. E. Thompson.*

The Basicity of Chromium Salts and its Graphical Representation. GEORG GRASSER. Collegium, 319–25, 1921. From Chem. Abst., 16: 357, January 20, 1922. In the reaction of a soluble chromium salt with sodium carbonate a series of basic compounds is obtained. The limiting compounds, i.e., chromium sulphate and chromium hydroxide, represent an increase in basicity from 0 to 100 per cent. A graphical method of denoting the basicity of intermediate compounds is described which may be applied generally to basic compounds.—*R. E. Thompson.*

Specification for Petroleum Products. Bureau of Mines Technical Paper 305. Specifications adopted by the Interdepartmental Petroleum Committee, effective January 23, 1922 and amended March 1, 1922, for the use of the various departments and independent establishments of the United States government. They supersede the specifications published in Bulletins 1 to 5, inclusive, of the Committee on Standardization of Petroleum Specifications. The products covered are gasoline, napthas, burning oils, fuel oils, and lubricants.—GEO. C. BUNKER.

How to Make Forms for Concrete Buildings. Beams & Girders. W. F. LOCKHARDT. Concrete, 20: 191, May, 1922. The fourth article of a practical series written for builders.—*Geo. C. Bunker.*

Measuring Area of Indicator Diagram. Power, 55: 693, May 2, 1922. Explains the use of the planimeter for obtaining the mean effective pressure. Illustrated.—*Geo. C. Bunker.*

An Electrically Operated CO_2 Recorder. W. G. WEBSTER. Power, 55: 691, May 2, 1922. Consists of a Wheatstone-Bridge with an indicating or recording galvanometer, calibrated in per cent CO_2, a soot filter, and a storage battery. Illustrated.—*Geo. C. Bunker.*

Finding the Developed Horsepower of an Engine. Power, 55: 735, May 9; 822, May 23, 1922. These articles deal with the process of computing the indicated horsepower. A table of horsepower per pound of mean effective pressure is included in the second article.—*Geo. C. Bunker.*

Water Returns to Steam Heating Boilers. Power, 55: 746, May 9, 1922. Abstract of the report of the Steam Boiler and Flywheel Service Bureau which is composed of the engineering heads of all the companies doing a boiler insurance business.—GEO. C. BUNKER.

Putting Steam Turbines in Service. Power, 55: 756, May 16, 1922. As the sizes of steam turbines increase, the problem of warming a unit up and putting it in service has become more serious. The starting of single-cylinder, tandem-compound and cross-compound two-and-three-cylinder machines is considered. Illustrated.—GEO. C. BUNKER.

A Meter for Recording Alkalinity of Boiler-Feed Water. R. C. ARTHUR AND E. A. KEELER. Power, 55: 768, May 16, 1922. The installation described

was conducted by the Leeds & Northrup Co. in co-operation with the Public Service Electric Company of New Jersey, at the Perth Amboy plant of the latter company. A new combined electrode, developed to take the place of the calomel and hydrogen electrodes, is immersed in a small bypassed flow of the feed water and recording potentiometer is used to record the voltage existing across the electrodes. The wide range of voltage for small changes in the hydrogen-ion concentration of the feed water makes the meter very sensitive to small changes in the quality of the feed water. The advantage of the acidity recorder lies in the convenience with which automatic control of alkalinity can be secured. By a simple system of relays and contacts a motor-operated valve can be made to control automatically the additions of an alkaline solution to the boiler-feed water. Such an equipment has been installed and the authors express the hope that data on its performance will soon be available for publication.—GEO. C. BUNKER.

Corrosion Due to Galvanic Effect. M. H. T. CRISP. Power, 55: 788, May 16, 1922. On two occasions, once in South Africa and once in India, the author found that wrought-iron pipe lines, half-buried in the ground, were being corroded on the inside and along the top at regular spacings of about 18 inches. Eventually jets of water appeared through some of the spots weakened by the corrosion. Burying the pipe-lines stopped the corrosion. The author believes that thermocouples existed due to the variation in temperature between the hot and cold portions of the pipe. The hot portion of the exposed pipe acted as the anode and the cooler portion as the cathode, with the water as the electrolyte, with the results that galvanic action developed.—GEO. C. BUNKER.

The Colorimetric Method of Determining Hydrogen Ion Concentration. Water & Water Eng. (London), 24: 131, April 20, 1922. An elementary discussion.—GEO. C. BUNKER.

The Price of Gas, Electricity, Water, etc., Before and After the War (in Germany.) PERMIEN. Gas-und Wasserfach, 65: 83–85, 1922. The price of water in Germany is from 6 to 10 times the pre-war price.—*Jack J. Hinman, Jr., (MF) (Courtesy Chem. Abst.)*

The Permissible Salt Concentration in Drinking Water. H. STOOF. Gas- und Wasserfach, 65: 59, 1922. The water of the Elbe and the Weser should not have its salt concentration raised above 250 to 350 parts per million by industrial wastes. Salt and potash plants should be required to treat at least a part of their wastes before discharging. References.—*Jack J. Hinman, Jr., (MF) (Courtesy Chem. Abst.)*

The Corrosion of Metal Conduits. HUGO KÜHL. Gas-und Wasserfach, 65: 99–102, 1922. A review of literature dealing with the corrosion of pipes and the prevention of trouble. Lead, copper, zinc, cast iron, and alloy pipes are considered.—*Jack J. Hinman, Jr., (MF.) (Courtesy Chem. Abst.)*

On Water Losses. M. ENGELMAN. Gas-und Wasserfach, 65: 115–117, 1922. cf. J. GASBELEUTUNG., 63: 528 and 660, 1920. An attempt to explain losses of water at Bielefeld, Germany. Loss through taps and appliances, leaks in piping system, incorrect metering, etc. amounted to 9.2 per cent. Loss not accounted for amounted to 9.7 per cent. The meters used did not register at rates less than 28 liters per hour (7.5-gallons per hour) and hence did not record part of the water lost through small leaks.—*Jack J. Hinman. Jr., (MF.) (Courtesy Chem. Abst.)*

Bacteria Fermenting Lactose and Their Significance in Water Analysis. MAX LEVINE. Iowa State College of Agriculture and Mechanical Arts Official Publication, 20: 31, 1921. A Bulletin of 127 pages in which the author reviews and brings together material from various sources, including his own published papers, grouped under the following topics: (1) Characteristics of the Colon Group of Bacteria. (2) Evidence of two Subdivisions in the Colon Group and tests for their Differentiation. The gas ratio, Voges Proskauer, methyl red, and uric acid tests are strikingly correlated. The members of the colon group which produce acetyl methyl carbinol, are capable of using the nitrogen from the purin ring of uric acid, give an alkaline reaction with the methyl red test, and in the decomposition of glucose, yield a relatively small quantity of acid and two or more times as much CO_2 as H_2. On the other hand, the organisms, which do not produce acetyl methyl carbinol, can not utilize the nitrogen from the purin ring, give an acid reaction with methyl red, break down glucose with the production of a relatively large amount of acid and liberate CO_2 and H_2 is approximately equal volumes. The colon group therefore includes two distinct subdivisions which are characteristically of different sources. These have been designated the coli and aerogenes sections. Their characteristics are tabulated below.

Table XIV. Differentiation of the main subdivisions of the colon group

SECTION	GAS RATIO CO_2/H_2	M. R. TEST	V. P. TEST	GROWTH URIC ACID MEDIUM	HABITAT
Coli	1.0 (Low ratio)	Acid	Neg.	Negative (No growth)	Predominates in feces and sewage
Aerogenes	1.5 or more (High ratio)	Alk.	Pos.	Positive (Good growth)	Predominates in soil and on grains

(3) Classifications of the Colon Group of Bacteria. (4) The Detection of the Colon Group in Water. (5) The Colon Group as an Index of Pollution. The colon group appears to be a convenient and desirable index. The presence of Bact. aerogenes alone in a supply may indicate merely remote pollution or soil contamination which is not objectionable or dangerous. Differentiation of coli and aerogenes in routine work is desirable because it may assist in the detection of the source or nature of the contamination. (6) The Spore Forming Lactose Fermenters and Their Significance in Water Analysis. Appendix A covers routine methods of water analysis and the Colon index. Appendix B is devoted to preparation of Culture media. The bulletin covers well the field of water bacteriology.—*H. L. Long (Courtesy A. M. Buswell).*

A Source of Lead Contamination of Cistern Water. LEONARD GREENBURG. Public Health Reports, 37:30, 1825, July 28, 1922. Report on lead contamination of drinking water in a cistern at U. S. Fish Hatchery station, Ten Pound Island, Gloucester, Mass. The lead flashing, on the roof of the building, was held responsible for the contamination, after experiments had eliminated lead pipe and lead paint.—*A. W. Blohm.*

CORRECTION: On p. 682, July, 1922, Abstracts section, read line 30: "Residual alum is found in the mechanically filtered water in colloidal form, which produces *no* after precipitation."—*Ed.*